

**LATE PRODUCTION LOT ADDENDUM  
FOR**

**FT-411**

**TECHNICAL SUPPLEMENT**

**MOTHER BOARD UNIT (PROD. LOT 17+)**

**IF UNIT (PROD. LOT 17+)**

**ANT SW UNIT (PROD. LOT 17+)**



**YAESU MUSEN CO., LTD.**

C.P.O. BOX 1500, TOKYO, JAPAN

**YAESU U.S.A.**

17210 Edwards Rd., Cerritos, California 90701, U.S.A.

**YAESU EUROPE B.V.**

Snipweg 3. 1118AA Schiphol, The Netherlands

Este manual foi doado por Bernardo Charnis da empresa  
wirelesstech.com.br para ser scaneado e disponibilizado  
GRATUITAMENTE a toda a comunidade

Scaneado em cores, 300 DPI (é o maximo que minha maquina faz,  
nao me batam) em uma copiadora Lexmark X864de, imagens  
tratadas com o programa IRFANVIEW e pdf gerado com o Adobe  
Acrobat XI Pro, usando Clearscan

Eu scaneio, trato e disponibilizo manuais gratuitamente meramente  
pelo prazer de faze-lo. Caso voce queira ajudar com manuais,  
insumos e ate mesmo uma merrequinha pra ajudar na conta de luz  
e na manutenção da maquina, entre em contato pelo email  
alexandre.tabajara@gmail.com (tambem é pix)

Obrigado a todos que ajudaram ate aqui

Os sites onde esses scans podem ser encontrados:

- [www.bama.org](http://www.bama.org)
- <http://tabajara-labs.blogspot.com>
- <http://tabalabs.com.br/esquemateca>
- <https://datassette.org/>

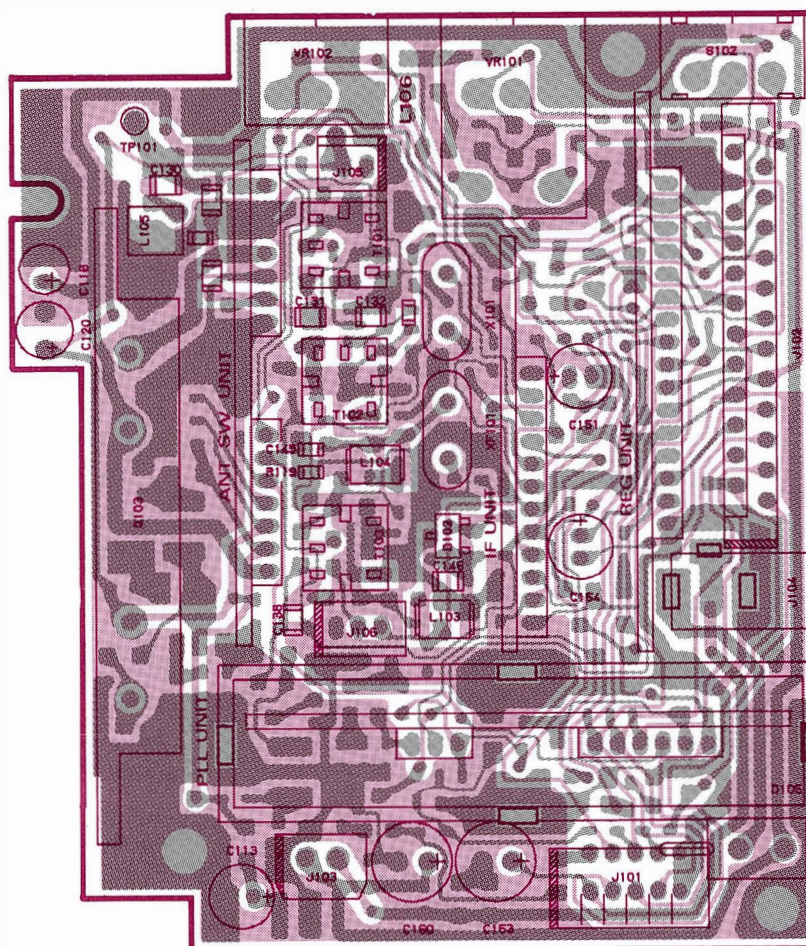
ATENÇÃO: AS PAGINAS EM BRANCO ESTAO EXATAMENTE  
COMO NO MANUAL. O OBJETIVO DE MANTE-LAS É VOCE  
PODER IMPRIMIR UM MANUAL IDENTICO AO ORIGINAL.  
NAO ESTÁ FALTANDO PAGINA NENHUMA NO MANUAL

Distribuição **GRATUITA**. Respeite o meu trabalho.

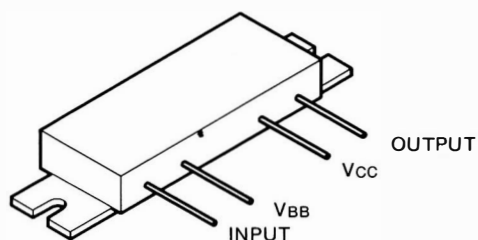
São Paulo, 31 de Julho de 2021

# MOTHER BOARD UNIT PARTS LAYOUT

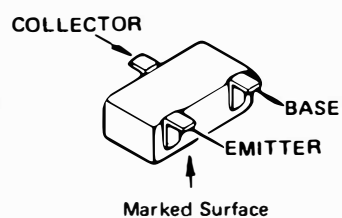
## MOTHER BOARD UNIT (No. 1 × ×)



obverse view of "component" side



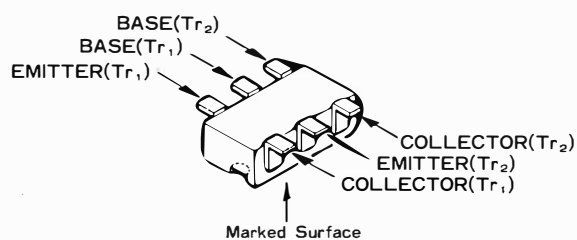
M57796MA (Q103)



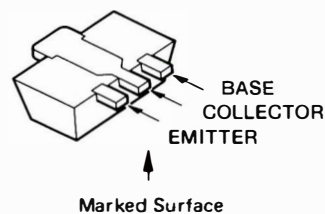
2SC2712GR (LG)  
(Q106,112,113)

DTA124EK (15) (Q110)  
DTC144EK (26)  
(Q104,105)

2SC2714Y (QY)  
(Q101,107)  
2SC3120 (HB) (Q108)



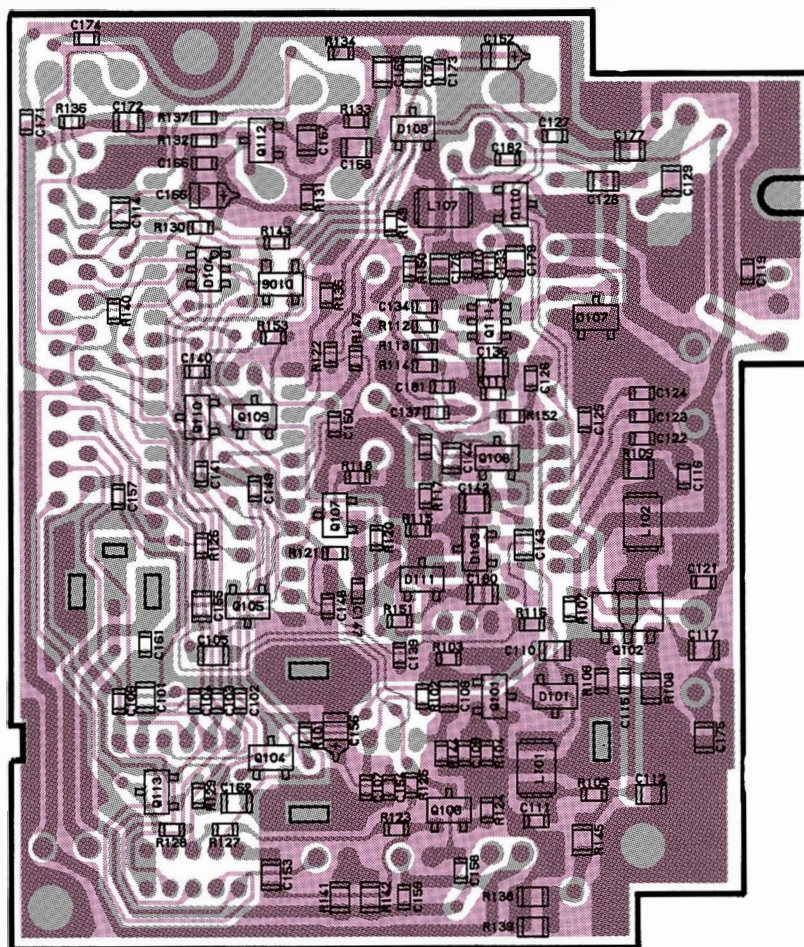
IMX5 (X5) (Q111)



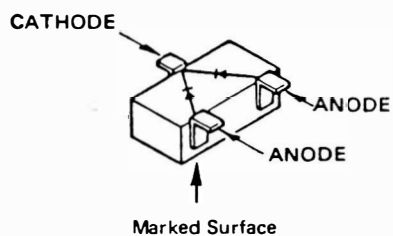
2SC2954 (QK) (Q102)



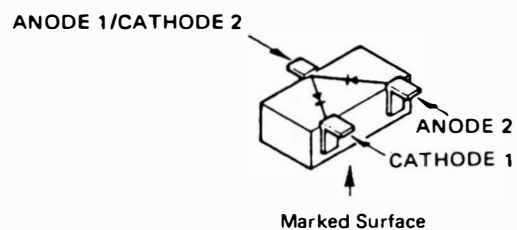
# MOTHER BOARD UNIT PARTS LAYOUT



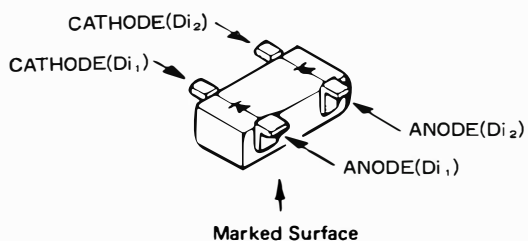
obverse view of "chip-only" side



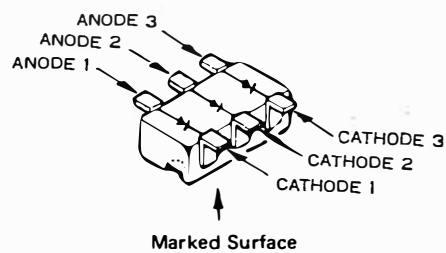
1SS184 (B3) (D101,109,110)



1SS226 (C3)  
(D102,107,108)



1SS272 (A1) (D106)

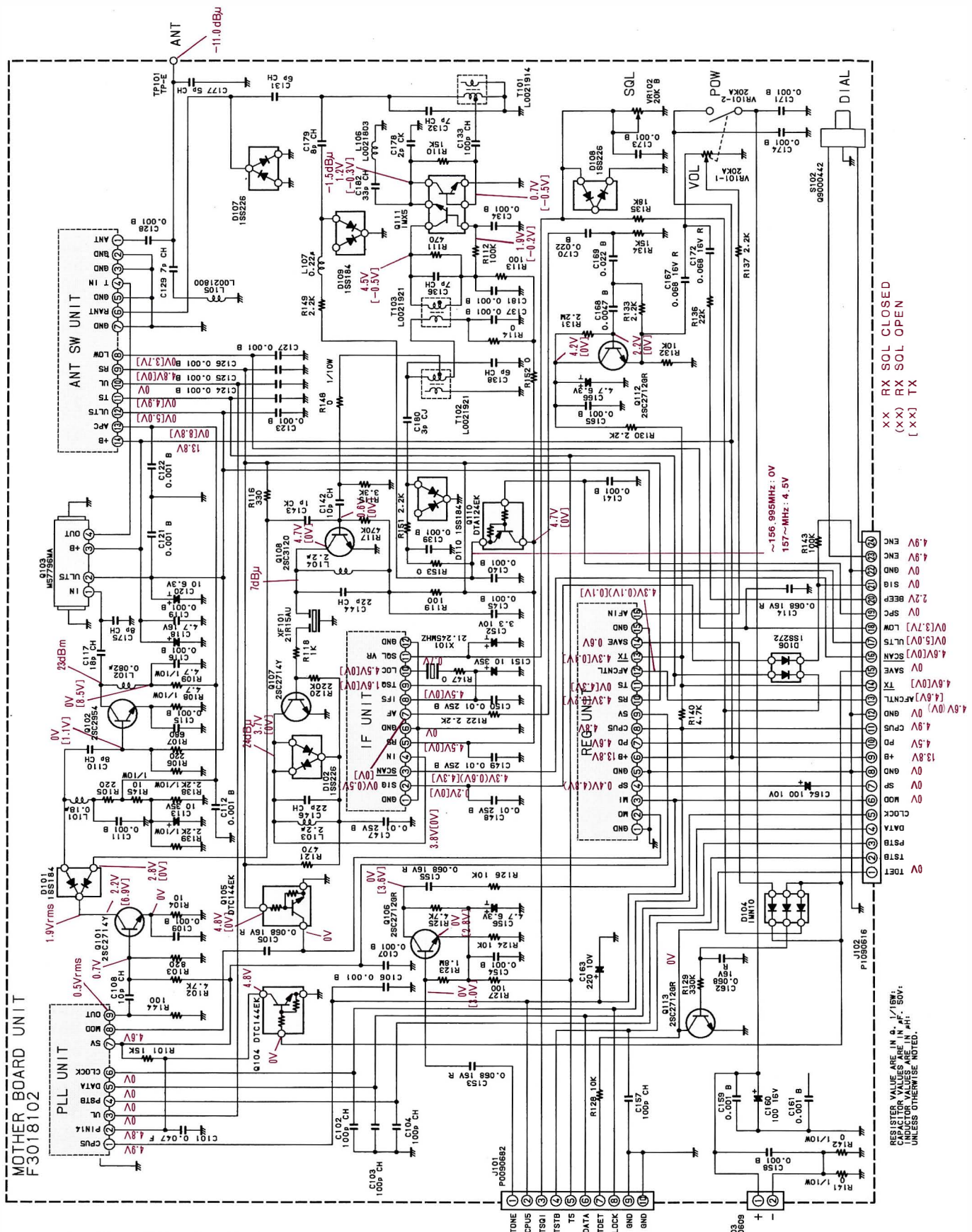


IMN10 (N10) (D104)



## SEMICONDUCTORS

### SUB-UNITS



# MOTHER BOARD UNIT PARTS LIST

## \*\*\* MOTHER BOARD UNIT \*\*\*

CP0958002 PCB with Components w/ sub-units Vers. A,B  
(REG,IF,ANT SW,PLL w/clock, Units)

CP0958003 PCB with Components w/ sub-units Vers. USA  
(REG,IF,ANT SW,PLL w/clock, Units)

F30181102D Printed Circuit Board

C 0101	K22171008	CHIP CAP.	GRM40F473Z50PT	0.047uF	50V	F
C 0102	K22174235	CHIP CAP.	GRM39CH101J50PT	100pF	50V	CH
C 0103	K22174235	CHIP CAP.	GRM39CH101J50PT	100pF	50V	CH
C 0104	K22174235	CHIP CAP.	GRM39CH101J50PT	100pF	50V	CH
C 0105	K22120805	CHIP CAP.	GRM40R683M16PT	0.068uF	16V	R
C 0106	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0107	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0108	K22170211	CHIP CAP.	GRM40CH100D50PT	10pF	50V	CH
C 0109	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0110	K22170209	CHIP CAP.	GRM40CH080D50PT	8pF	50V	CH
C 0111	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0112	K22170805	CHIP CAP.	GRM40B102M50PT	0.001uF	50V	B
C 0113	K40169025	AL.ELECTRO.CAP.	RC2-35V100MS-F1	10uF	35V	
C 0114	K22120805	CHIP CAP.	GRM40R683M16PT	0.068uF	16V	R
C 0115	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0116	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0117	K22170217	CHIP CAP.	GRM40CH180J50PT	18pF	50V	CH
C 0118	K40129059	AL.ELECTRO.CAP.	RC3-16V4R7MS(3X5)	4.7uF	16V	
C 0119	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0120	K70087106	TANTALUM CAP.	DN0J100M1S	10uF	6.3V	
C 0121	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0122	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0123	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0124	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0125	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0126	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0127	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0128	K22170805	CHIP CAP.	GRM40B102M50PT	0.001uF	50V	B
C 0129	K22170208	CHIP CAP.	GRM40CH070D50PT	7pF	50V	CH
C 0131	K22170207	CHIP CAP.	GRM40CH060D50PT	6pF	50V	CH
C 0132	K22170208	CHIP CAP.	GRM40CH070D50PT	7pF	50V	CH
C 0133	K22174235	CHIP CAP.	GRM39CH101J50PT	100pF	50V	CH
C 0134	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0136	K22170208	CHIP CAP.	GRM40CH070D50PT	7pF	50V	CH
C 0137	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0138	K22170207	CHIP CAP.	GRM40CH060D50PT	6pF	50V	CH
C 0139	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0140	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0141	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0142	K22170211	CHIP CAP.	GRM40CH100D50PT	10pF	50V	CH
C 0143	K22170202	CHIP CAP.	GRM40CK010C50PT	1pF	50V	CK
C 0144	K22174219	CHIP CAP.	GRM39CH220J50PT	22pF	50V	CH
C 0145	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0146	K22174219	CHIP CAP.	GRM39CH220J50PT	22pF	50V	CH
C 0147	K22144802	CHIP CAP.	GRM39B103M25PT	0.01uF	25V	B
C 0148	K22144802	CHIP CAP.	GRM39B103M25PT	0.01uF	25V	B
C 0149	K22144802	CHIP CAP.	GRM39B103M25PT	0.01uF	25V	B
C 0150	K22144802	CHIP CAP.	GRM39B103M25PT	0.01uF	25V	B
C 0151	K40169012	AL.ELECTRO.CAP.	RE-35V100M	10uF	35V	
C 0152	K78100002	CHIP TA CAP.	F951A335MSAAF1Q2	3.3uF	10V	
C 0153	K22120805	CHIP CAP.	GRM40R683M16PT	0.068uF	16V	R



# MOTHER BOARD UNIT PARTS LIST

C 0154	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0155	K22120805	CHIP CAP.	GRM40R683M16PT	0.068uF	16V	R
C 0156	K78080002	CHIP TA CAP.	F950J475MSAAF1Q2	4.7uF	6.3V	
C 0157	K22174235	CHIP CAP.	GRM39CH101J50PT	100pF	50V	CH
C 0158	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0159	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0160	K40129060	AL.ELECTRO.CAP.	CEDSM1C101M	100uF	16V	
C 0161	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0162	K22120805	CHIP CAP.	GRM40R683M16PT	0.068uF	16V	R
C 0163	K40109027	AL.ELECTRO.CAP.	CEDSM1A221M	220uF	10V	
C 0164	K40109026	AL.ELECTRO.CAP.	10VB-100(M)CC	100uF	10V	
C 0165	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0166	K78080002	CHIP TA CAP.	F950J475MSAAF1Q2	4.7uF	6.3V	
C 0167	K22120805	CHIP CAP.	GRM40R683M16PT	0.068uF	16V	R
C 0168	K22170813	CHIP CAP.	GRM40B472M50PT	0.0047uF	50V	B
C 0169	K22170821	CHIP CAP.	GRM40B223M50PT	0.022uF	50V	B
C 0170	K22170821	CHIP CAP.	GRM40B223M50PT	0.022uF	50V	B
C 0171	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0172	K22120805	CHIP CAP.	GRM40R683M16PT	0.068uF	16V	R
C 0173	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0174	K22174821	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0175	K22170209	CHIP CAP.	GRM40CH080D50PT	8pF	50V	CH
C 0177	K22170206	CHIP CAP.	GRM40CH050C50PT	5pF	50V	CH
C 0178	K22170203	CHIP CAP.	GRM40CK020C50PT	2pF	50V	CK
C 0179	K22170209	CHIP CAP.	GRM40CH080D50PT	8pF	50V	CH
C 0180	K22170204	CHIP CAP.	GRM40CJ030C50PT	3pF	50V	CJ
C 0181	K22174809	CHIP CAP.	GRM39B102K50PT	0.001uF	50V	B
C 0182	K22174223	CHIP CAP.	GRM39CH330J50PT	33pF	50V	CH
D 0101	G2070009	DIODE	1SS184 TE85R			
D 0102	G2070003	DIODE	1SS226 TE85R			
D 0104	G2070078	DIODE	1MN10 T108			
D 0106	G2070048	DIODE	1SS272 TE85R			
D 0107	G2070003	DIODE	1SS226 TE85R			
D 0108	G2070003	DIODE	1SS226 TE85R			
D 0109	G2070009	DIODE	1SS184 TE85R			
D 0110	G2070009	DIODE	1SS184 TE85R			
J 0101	P0090682	CONNECTOR	53020-1010			
J 0102	P1090616	CONNECTOR	52030-2410			
J 0103	P0090609	CONNECTOR	SB20-02WS			
L 0101	L1690014	CHIP COIL	LQN2AR18K	0.18uH		
L 0102	L1690010	CHIP COIL	LQN2A82NM	0.082uH		
L 0103	L1690017	COIL	32CS 380LB-2R2M=P	2.2uH		
L 0104	L1690017	COIL	32CS 380LB-2R2M=P	2.2uH		
L 0105	L0021800	COIL	3.5T2.0D0.5UEW R			
L 0106	L0021803	COIL	6.5T2.0D0.5UEW R			
L 0107	L1690003	CHIP COIL	LQN2AR22K	0.22uH		
Q 0101	G3327147Y	TRANSISTOR	2SC2714Y			
Q 0102	G3329547	TRANSISTOR	2SC2954			
Q 0103	G1090732	IC	M57796MA			
Q 0104	G3070033	TRANSISTOR	DTC144EK			
Q 0105	G3070033	TRANSISTOR	DTC144EK			
Q 0106	G3327127G	TRANSISTOR	2SC2712GR			
Q 0107	G3327147Y	TRANSISTOR	2SC2714Y			
Q 0108	G3331207	TRANSISTOR	2SC3120			
Q 0110	G3070030	TRANSISTOR	DTA124EK			
Q 0111	G3070028	TRANSISTOR	IMX5			
Q 0112	G3327127G	TRANSISTOR	2SC2712GR			

# MOTHER BOARD UNIT PARTS LIST

Q 0113	G3327127G	TRANSISTOR	2SC2712GR		
R 0101	J24185153	CHIP RES.	RMC1/16 153JATP	15K	1/16W
R 0102	J24185472	CHIP RES.	RMC1/16 472JATP	4.7K	1/16W
R 0103	J24185821	CHIP RES.	RMC1/16 821JATP	820	1/16W
R 0104	J24185100	CHIP RES.	RMC1/16 100JATP	10	1/16W
R 0105	J24185221	CHIP RES.	RMC1/16 221JATP	220	1/16W
R 0106	J24185221	CHIP RES.	RMC1/16 221JATP	220	1/16W
R 0107	J24185681	CHIP RES.	RMC1/16 681JATP	680	1/16W
R 0108	J24205479	CHIP RES.	RMC1/10T 4R7J	4.7	1/10W
R 0109	J24205479	CHIP RES.	RMC1/10T 4R7J	4.7	1/10W
R 0110	J24185153	CHIP RES.	RMC1/16 153JATP	15K	1/16W
R 0111	J24185471	CHIP RES.	RMC1/16 471JATP	470	1/16W
R 0112	J24185104	CHIP RES.	RMC1/16 104JATP	100K	1/16W
R 0113	J24185101	CHIP RES.	RMC1/16 101JATP	100	1/16W
R 0114	J24185000	CHIP RES.	RMC1/16 000JATP	0	1/16W
R 0115	J24185332	CHIP RES.	RMC1/16 332JATP	3.3K	1/16W
R 0116	J24185331	CHIP RES.	RMC1/16 331JATP	330	1/16W
R 0117	J24185474	CHIP RES.	RMC1/16 474JATP	470K	1/16W
R 0118	J24185102	CHIP RES.	RMC1/16 102JATP	1K	1/16W
R 0119	J24185101	CHIP RES.	RMC1/16 101JATP	100	1/16W
R 0120	J24185224	CHIP RES.	RMC1/16 224JATP	220K	1/16W
R 0121	J24185471	CHIP RES.	RMC1/16 471JATP	470	1/16W
R 0122	J24185222	CHIP RES.	RMC1/16 222JATP	2.2K	1/16W
R 0123	J24185185	CHIP RES.	RMC1/16 185JATP	1.8M	1/16W
R 0124	J24185103	CHIP RES.	RMC1/16 103JATP	10K	1/16W
R 0125	J24185472	CHIP RES.	RMC1/16 472JATP	4.7K	1/16W
R 0126	J24185103	CHIP RES.	RMC1/16 103JATP	10K	1/16W
R 0127	J24185101	CHIP RES.	RMC1/16 101JATP	100	1/16W
R 0128	J24185103	CHIP RES.	RMC1/16 103JATP	10K	1/16W
R 0129	J24185334	CHIP RES.	RMC1/16 334JATP	330K	1/16W
R 0130	J24185222	CHIP RES.	RMC1/16 222JATP	2.2K	1/16W
R 0131	J24185225	CHIP RES.	RMC1/16 225JATP	2.2M	1/16W
R 0132	J24185103	CHIP RES.	RMC1/16 103JATP	10K	1/16W
R 0133	J24185222	CHIP RES.	RMC1/16 222JATP	2.2K	1/16W
R 0134	J24185153	CHIP RES.	RMC1/16 153JATP	15K	1/16W
R 0135	J24185183	CHIP RES.	RMC1/16 183JATP	18K	1/16W
R 0136	J24185223	CHIP RES.	RMC1/16 223JATP	22K	1/16W
R 0137	J24185222	CHIP RES.	RMC1/16 222JATP	2.2K	1/16W
R 0138	J24205222	CHIP RES.	RMC1/10T 222J	2.2K	1/10W
R 0139	J24205222	CHIP RES.	RMC1/10T 222J	2.2K	1/10W
R 0140	J24185472	CHIP RES.	RMC1/16 472JATP	4.7K	1/16W
R 0141	J24205000	CHIP RES.	RMC1/10T 000J	0	1/10W
R 0142	J24205000	CHIP RES.	RMC1/10T 000J	0	1/10W
R 0143	J24185104	CHIP RES.	RMC1/16 104JATP	100K	1/16W
R 0144	J24185101	CHIP RES.	RMC1/16 101JATP	100	1/16W
R 0145	J24205100	CHIP RES.	RMC1/10T 100J	10	1/10W
R 0147	J24185000	CHIP RES.	RMC1/16 000JATP	0	1/16W
R 0148	J24205000	CHIP RES.	RMC1/10T 000J	0	1/10W
R 0149	J24185222	CHIP RES.	RMC1/16 222JATP	2.2K	1/16W
R 0151	J24185222	CHIP RES.	RMC1/16 222JATP	2.2K	1/16W
R 0152	J24185000	CHIP RES.	RMC1/16 000JATP	0	1/16W
R 0153	J24185000	CHIP RES.	RMC1/16 000JATP	0	1/16W
S 0102	Q9000442	ROTARY CODE SWITCH	EC09P20-04	EC09P20-04	
T 0101	L0021914	CHIP TRANS	CS-5 2276-202		
T 0102	L0021921	COIL	CS-5 2276-221		
T 0103	L0021921	COIL	CS-5 2276-221		
TP0101	Q5000016	TERMINAL	TP-E/MS-60124	TP-E	

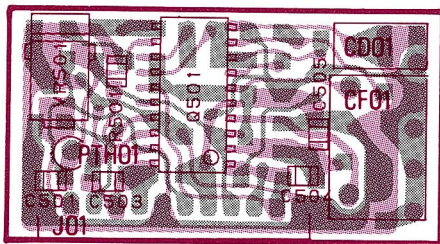


# MOTHER BOARD UNIT PARTS LIST

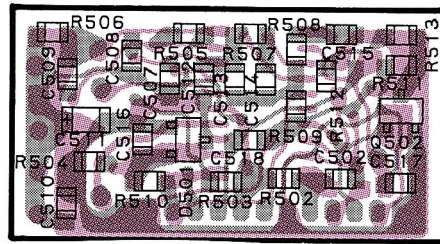
VR0101	J60800149	POT.	RK0971111	20KA
VR0102	J60800150	POT.	RK0971110	20KB
X 0101	H0102966	XTAL	UM-1	21.245MHZ
XF0101	H1102174	XTAL FILTER	21R15AU	21R15AU

# IF UNIT PARTS LAYOUT/CIRCUIT DIAGRAM

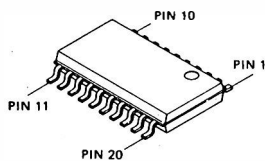
IF UNIT (No. 5 × ×)



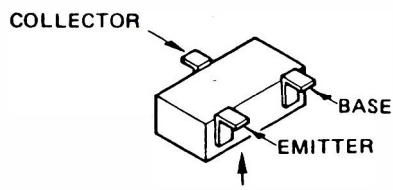
obverse view of "mixed-component" side



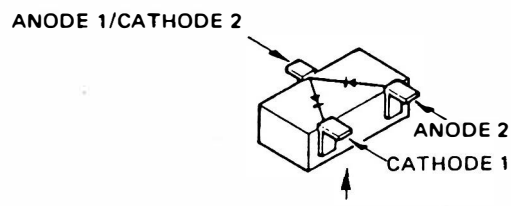
obverse view of "chip-only" side



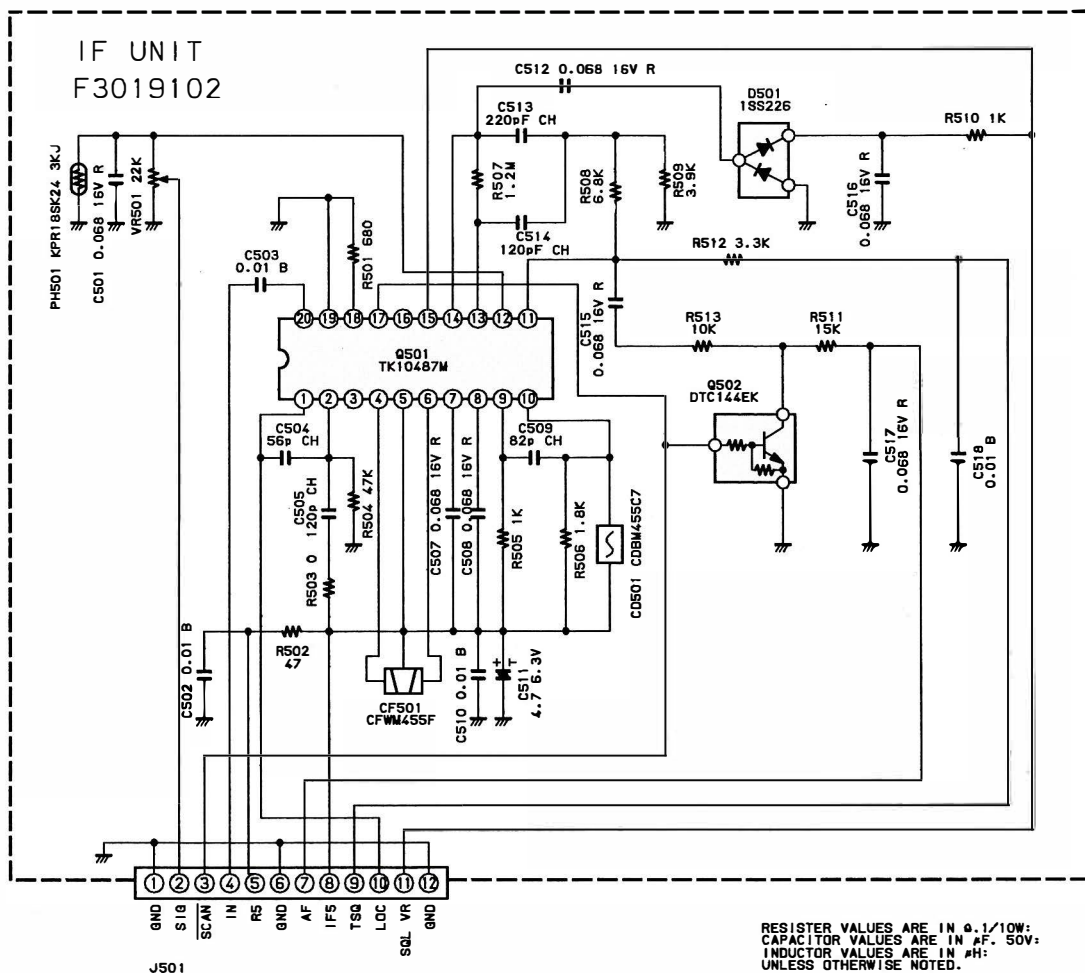
TK10487M (Q501)



DTC144EK (26) (Q502)



1SS226 (C3) (D501)



# IF UNIT PARTS LIST

## \*\*\* IF UNIT \*\*\*

CP0961003 PCB with Components Vers. A,B

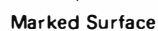
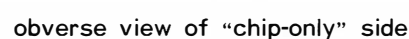
CP0961004 PCB with Components Vers. USA

F3019102A Printed Circuit Board

C 0501	K22120805	CHIP CAP.	GRM40R683M16PT	0.068uF	16V	R
C 0502	K22170817	CHIP CAP.	GRM40B103M50PT	0.01uF	50V	B
C 0503	K22170817	CHIP CAP.	GRM40B103M50PT	0.01uF	50V	B
C 0504	K22170229	CHIP CAP.	GRM40CH560J50PT	56pF	50V	CH
C 0505	K22170237	CHIP CAP.	GRM40CH121J50PT	120pF	50V	CH
C 0507	K22120805	CHIP CAP.	GRM40R683M16PT	0.068uF	16V	R
C 0508	K22120805	CHIP CAP.	GRM40R683M16PT	0.068uF	16V	R
C 0509	K22170233	CHIP CAP.	GRM40CH820J50PT	82pF	50V	CH
C 0510	K22170817	CHIP CAP.	GRM40B103M50PT	0.01uF	50V	B
C 0511	K78080002	CHIP TA CAP.	F950J475MSAAF1Q2	4.7uF	6.3V	
C 0512	K22120805	CHIP CAP.	GRM40R683M16PT	0.068uF	16V	R
C 0513	K22170243	CHIP CAP.	GRM40CH221J50PT	220pF	50V	CH
C 0514	K22170237	CHIP CAP.	GRM40CH121J50PT	120pF	50V	CH
C 0515	K22120805	CHIP CAP.	GRM40R683M16PT	0.068uF	16V	R
C 0516	K22120805	CHIP CAP.	GRM40R683M16PT	0.068uF	16V	R
C 0517	K22120805	CHIP CAP.	GRM40R683M16PT	0.068uF	16V	R
C 0518	K22170817	CHIP CAP.	GRM40B103M50PT	0.01uF	50V	B
CD0501	H7900480		CDBM455C7			
CF0501	H3900395		CFWM455F			
D 0510	G2070003		1SS226 TE85R			
J 0501	P0090677		IMSA-9230B-1-12Z009-T			
PTH501	G9090036		KPR18SK24	3KJ		
Q 0501	G1090859	IC	TK10487M			
Q 0502	G3070033	TRANSISTOR	DTC144EK T97			
R 0501	J24205681	CHIP RES.	RMC1/10T 681J	680	1/10W	
R 0502	J24205470	CHIP RES.	RMC1/10T 470J	47	1/10W	
R 0503	J24205000	CHIP RES.	RMC1/10T 000J	0	1/10W	
R 0504	J24205473	CHIP RES.	RMC1/10T 473J	47K	1/10W	
R 0505	J24205102	CHIP RES.	RMC1/10T 102J	1K	1/10W	
R 0506	J24205182	CHIP RES.	RMC1/10T 182J	1.8K	1/10W	
R 0507	J24205125	CHIP RES.	RMC1/10T 125J	1.2M	1/10W	
R 0508	J24205682	CHIP RES.	RMC1/10T 682J	6.8K	1/10W	
R 0509	J24205392	CHIP RES.	RMC1/10T 392J	3.9K	1/10W	
R 0510	J24205102	CHIP RES.	RMC1/10T 102J	1K	1/10W	
R 0511	J24205153	CHIP RES.	RMC1/10T 153J	15K	1/10W	
R 0512	J24205332	CHIP RES.	RMC1/10T 332J	3.3K	1/10W	
R 0513	J24205103	CHIP RES.	RMC1/10T 103J	10K	1/10W	
VR0501	J50779223	CHIP VR.	RH04AVCJ4W	22K		



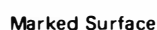
ANT SW UNIT (No.7 XX)



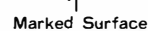
2SC2712GR (LG) (Q702)  
DTC144EK (26) (Q703)



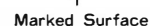
2SB799 (ML) (Q704,706)



1SS184 (B3) (D704)  
1SS321 (F9) (D701)



FMS1 (S1) (Q701), FMW1 (W1) (Q705)



H7M7C (24) (D705)



# ANT SW UNIT PARTS LIST

\*\*\* ANT SW UNIT \*\*\*

CP0962001 PCB with Components

F3019103B Printed Circuit Board

C 0701	K22170213	CHIP CAP.	GRM40CH120J50PT	12pF	50V	CH
C 0702	K22170225	CHIP CAP.	GRM40CH390J50PT	39pF	50V	CH
C 0703	K22170205	CHIP CAP.	GRM40CH040C50PT	4pF	50V	CH
C 0704	K22170225	CHIP CAP.	GRM40CH390J50PT	39pF	50V	CH
C 0705	K22170225	CHIP CAP.	GRM40CH390J50PT	39pF	50V	CH
C 0707	K22170213	CHIP CAP.	GRM40CH120J50PT	12pF	50V	CH
C 0708	K22170805	CHIP CAP.	GRM40B102M50PT	0.001uF	50V	B
C 0709	K22170202	CHIP CAP.	GRM40CK010C50PT	1pF	50V	CK
C 0710	K22170202	CHIP CAP.	GRM40CK010C50PT	1pF	50V	CK
C 0711	K22170805	CHIP CAP.	GRM40B102M50PT	0.001uF	50V	B
C 0712	K22170817	CHIP CAP.	GRM40B103M50PT	0.01uF	50V	B
C 0713	K22170805	CHIP CAP.	GRM40B102M50PT	0.001uF	50V	B
C 0714	K78120009	CHIP TA CAP.	TESVA1C105M1-8R	1uF	16V	
C 0715	K22171008	CHIP CAP.	GRM40F473Z50PT	0.047uF	50V	F
C 0716	K22170805	CHIP CAP.	GRM40B102M50PT	0.001uF	50V	B
C 0717	K22170205	CHIP CAP.	GRM40CH040C50PT	4pF	50V	CH
D 0701	G2070076	DIODE	1SS321 TE85R			
D 0702	G2040001	DIODE	1SS135 T-91			
D 0703	G2040001	DIODE	1SS135 T-91			
D 0704	G2070009	DIODE	1SS184 TE85R			
D 0705	G2070070	DIODE	HZM7C-TR			
J 0701	P0090676	CONNECTOR	IMSA-9230B-1-07Z009-T			
J 0702	P0090676	CONNECTOR	IMSA-9230B-1-07Z009-T			
L 0701	L0021774A	COIL	6.5T2.0D0.5UEW R			
L 0702	L0021774A	COIL	6.5T2.0D0.5UEW R			
L 0703	L0021774A	COIL	6.5T2.0D0.5UEW R			
L 0704	L1690016	RFC	32CS 380LB-1ROM=P	1uH		
L 0705	L0021774A	COIL	6.5T2.0D0.5UEW R			
L 0706	L0021774A	COIL	6.5T2.0D0.5UEW R			
Q 0701	G3070008	TRANSISTOR	FMS1 T-98			
Q 0702	G3327127G	TRANSISTOR	2SC2712GR TE85R			
Q 0703	G3070033	TRANSISTOR	DTC144EK T-98			
Q 0704	G3207997L	TRANSISTOR	2SB799-T2ML			
Q 0705	G3070009	TRANSISTOR	FMW1 T-98			
Q 0706	G3207997L	TRANSISTOR	2SB799-T2ML			
R 0701	J24205103	CHIP RES.	RMC1/10T 103J	10K	1/10W	
R 0702	J24205103	CHIP RES.	RMC1/10T 103J	10K	1/10W	
R 0703	J24205182	CHIP RES.	RMC1/10T 182J	1.8K	1/10W	
R 0704	J24205103	CHIP RES.	RMC1/10T 103J	10K	1/10W	
R 0705	J24205104	CHIP RES.	RMC1/10T 104J	100K	1/10W	
R 0706	J24205183	CHIP RES.	RMC1/10T 183J	18K	1/10W	
R 0707	J24205682	CHIP RES.	RMC1/10T 682J	6.8K	1/10W	
R 0708	J24205391	CHIP RES.	RMC1/10T 391J	390	1/10W	
R 0709	J24205221	CHIP RES.	RMC1/10T 221J	220	1/10W	
R 0710	J24205332	CHIP RES.	RMC1/10T 332J	3.3K	1/10W	
R 0711	J24205102	CHIP RES.	RMC1/10T 102J	1K	1/10W	
R 0712	J24205332	CHIP RES.	RMC1/10T 332J	3.3K	1/10W	
R 0713	J24205102	CHIP RES.	RMC1/10T 102J	1K	1/10W	
R 0714	J24205224	CHIP RES.	RMC1/10T 224J	220K	1/10W	
R 0715	J24205332	CHIP RES.	RMC1/10T 332J	3.3K	1/10W	
R 0716	J24205102	CHIP RES.	RMC1/10T 102J	1K	1/10W	
R 0717	J24205102	CHIP RES.	RMC1/10T 102J	1K	1/10W	
VR0701	J50779103	CHIP VR.	RH04AVC14W	10KB		





## ALIGNMENT

The FT-411 has been carefully aligned at the factory, and is designed so that, during proper use, no further alignment should ever be required. However, if misused, or in the unlikely event of a component failure, realignment may be necessary. Before realignment, the cause of the fault must be determined and corrected.

The small size of the FT-411 makes it difficult for the average operator to service. For this reason, we recommend that all component replacement and service be performed only by authorized Yaesu representatives. Any service attempt by unauthorized persons is done at the owner's risk, and may void the warranty.

The following test equipment is required for alignment:

RF Signal Generator with calibrated output level at 170 MHz

Deviation Meter (linear detector)

Oscilloscope

AF Millivoltmeter

SINAD Meter

In-Line Wattmeter (accurate at 170 MHz)

Dummy Load (50-ohm, non-reactive at 170 MHz)

Regulated, Adjustable DC Power Supply (2A @ 4 to 17V) with Ammeter

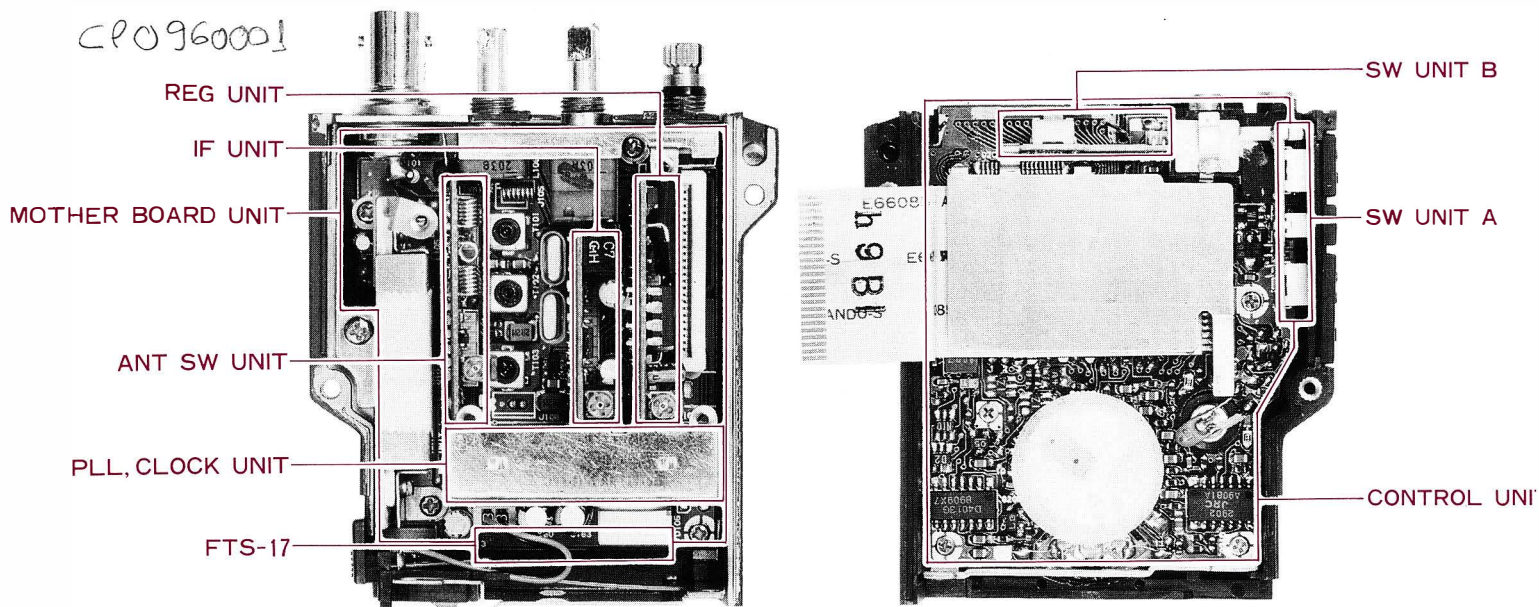
Frequency Counter ( $\pm 0.2$  ppm @ 170 MHz)

AF Signal Generator

DC Voltmeter (10-Megohm impedance)

## CAUTION!

The FT-411 cannot be properly aligned with an antenna, because of interaction between the antenna and the transceiver circuitry.



BOARD LOCATIONS

# ALIGNMENT (PLL & Transmitter)

## PLL VCV (Varactor Control Voltage)

Connect the DC voltmeter between L801 on the PLL Unit and Chassis Ground. Tune the transceiver to 144.000 MHz, close the PTT switch and adjust T801 on the PLL Unit for  $0.73 \pm 0.05$  VDC on the meter.

## Transmitter Output Power

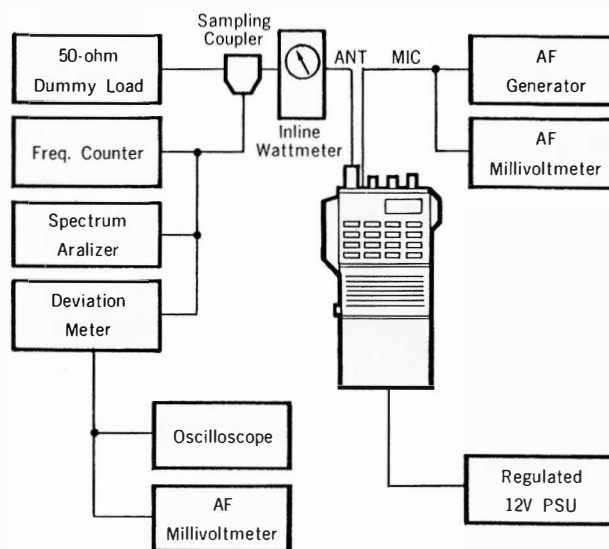
Tune the transceiver to the center of the band (145 or 146 MHz), and set the LOW switch to the high power (undepressed) position. Increase the supply voltage to 13.8V, and adjust VR701 on the Antenna SW Unit for peak output power (at least 5 watts with less than 1.5A supply current). Press the LOW switch and confirm 0.3 to 1.0 watt, then return the supply voltage to 12V.

## PLL Reference Frequency

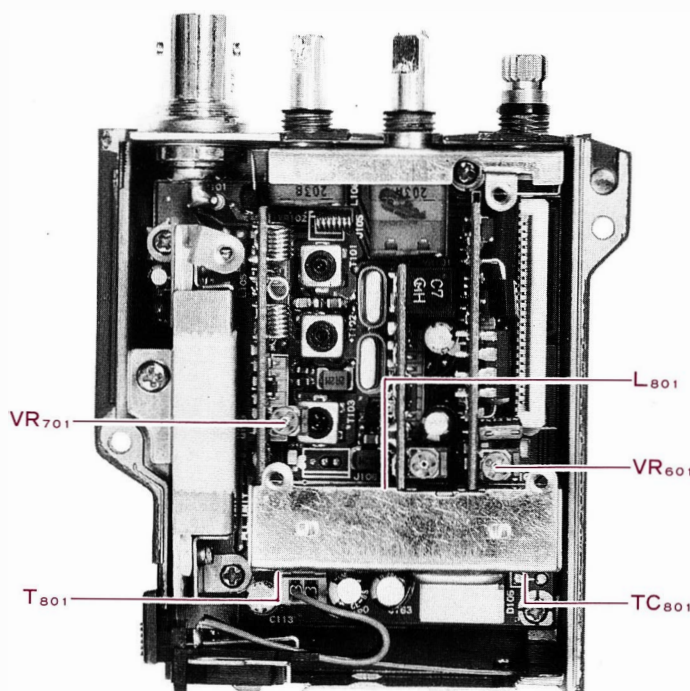
With the transceiver tuned to the center of the band (145 or 146 MHz), adjust TC801 on the PLL Unit, if necessary, so that the display frequency matches the frequency counter when transmitting.

## Modulation Level

With the transceiver tuned to the center of the band (145 or 146 MHz), set the AF generator for 25mV injection at 1 kHz to the MIC jack. Adjust VR601 on the Regulator Unit for  $\pm 4.5$  kHz deviation on the deviation meter.



PLL & TRANSMITTER ALIGNMENT SETUP



PLL & TRANSMITTER ALIGNMENT POINTS

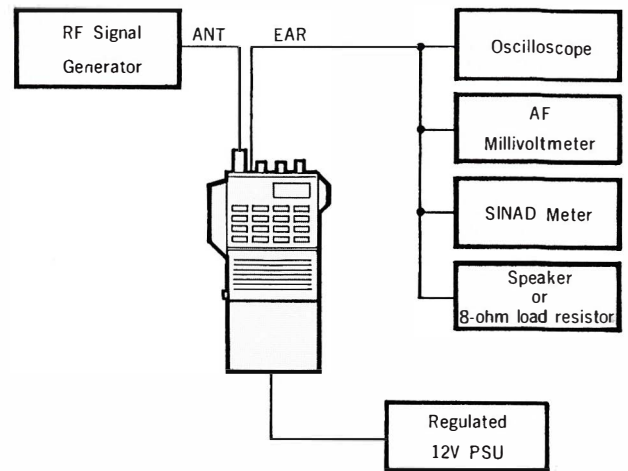


# (Receiver) ALIGNMENT

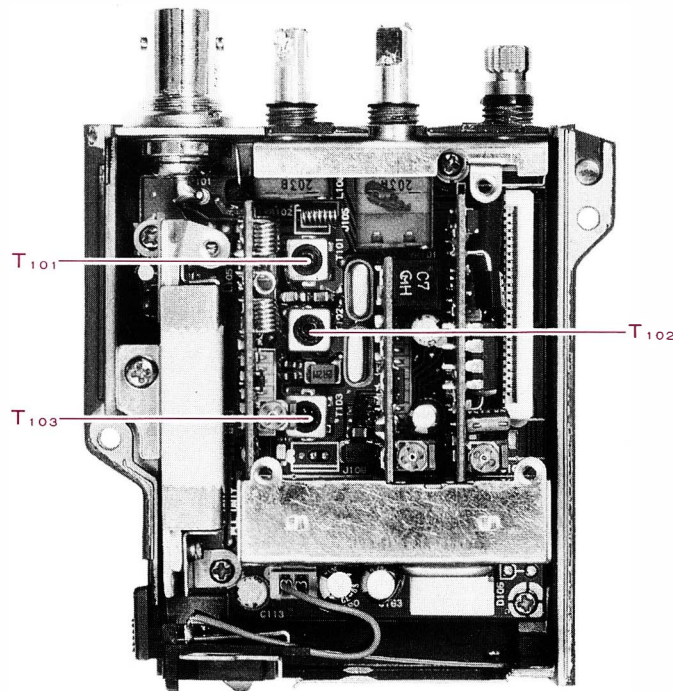
Set up the test equipment as shown above for receiver alignment.

With the transceiver and RF signal generator both tuned to the center of coverage (145 or 146 MHz), inject a 1 kHz tone with  $\pm 3.5$  kHz deviation at 40 dBu to the antenna jack.

Adjust T101 through T103 on the Mother Board for maximum S-meter indication, reducing the injection level if more than four meter segments turn on. Repeat these adjustments until the generator level is 0.2 uV or less for 12dB SINAD.



RECEIVER ALIGNMENT SETUP



RECEIVER ALIGNMENT POINTS



# NOTES





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